

HSIAC

HSIAC's scope includes, but is not limited to, the following areas:

- Human Factors Engineering
- Health Hazards
- Safety Factors
- Personnel Survivability Factors
- Manpower, Personnel, & Training
- Medical Factors
- Automation & Human-Machine Integration
- Display & Control Design
- Environmental Issues
- Equipment & Vehicle Design
- Human Characteristics
- Human-Computer Interfaces
- Information Presentation & Communication
- Methods for Research, Testing, & Evaluation
- Performance-Related Factors
- System Perspectives
- Work Design & Organization
- Workstation & Facility Design

HSIAC deals with the human component of a system using a total system approach. DoD policy stresses the importance of optimizing total system performance and minimizing the life-cycle cost of ownership through a total system approach to acquisition management. The total system includes not just the prime mission equipment, but also the people who operate, maintain, and support the system; the training and training devices; and the operational and support infrastructure.

Researchers, designers, and engineers must accommodate a number of difficult physical and mechanical variables when they design and produce equipment. They also must account for the capabilities and limitations of the human beings who will manufacture, operate, and maintain that equipment.

TATs & Products

The Human Systems IAC's area of expertise is human factors and ergonomics, an integrative discipline devoted to understanding and quantifying human interaction with equipment and systems. It encompasses a broad scope of issues important to the design of safe, effective, user-friendly, and maintenance-friendly systems. Services often take the form of technical area tasks (TATs), a few of which are described below. Also described below are a few of our products, including state-of-the-art reports and data files.

Controller-Pilot Data Link Communication (CPDLC)

The current Federal Aviation Administration (FAA) voice-traffic communication system is deficient in many ways. For example, messages are frequently misinterpreted, and the capacity-limited system can cause extensive delays. The FAA requested information for use in developing cockpit data-link studies, and for use in updating FAA Advisory Circulars related to flight-deck systems. The Human Systems IAC provided human factors support of large-scale distributed simulations of data link communication systems. Other Human Systems IAC studies have examined flight deck interface options, investigated training/procedures issues, and assessed crew resource management.



Human Systems Information Analysis Center (formerly CSERIAC)

Software Usability Test & Evaluation

The Performance Results Evaluation & Management Information System (PREMIS) is the software program used by DTIC to implement and track contract actions. The Human Systems IAC employed a top-level design approach to evaluate the PREMIS operator interface with respect to human factors principles and make recommendations that would improve the operability, effectiveness, and user acceptance of PREMIS.

Flight Simulator Training Capability Evaluation

The C130 Weapon System Trainer is a state-of-the-art, motion-based flight simulator used to support the training of night-vision goggle (NVG) operations as well as to properly train crewmembers to operate the C130 aircraft in an integrated systems environment. The U.S. Air Force needed to determine the training capabilities of the NVG and out-the-window visual display prior to simulator certification. The Human Systems IAC developed and administered a crewmember survey designed to provide quantitative and subjective feedback on the training effectiveness of the system.

Behind Human Error: Cognitive Systems, Computer, & Hindsight

This report discusses the larger systems that practitioners operate and shows how factors such as organizational processes and technology design affect cognition and behavior. Examples from various domains are

used to illustrate deficiencies in computerized devices that lead to breakdowns in interactions. The report explains how these deficiencies can exist without giving rise to accidents and discusses the role of outcome knowledge in the attribution of error.

Improving Function Allocation for Integrated System Design

This report explains the procedures and tools used for delegating tasks between humans and machines. It reviews the increasing complexity of this process due to technological changes and reviews how function allocation techniques have changed as systems and theories have progressed. The authors provide engineers and designers with the tools they need, the rationale behind the task, methods for evaluating decisions, and examples of applying the techniques.

Anthropometric Data Files

The anthropometric data files offer designers and engineers data useful for resolving human physical accommodation issues during equipment design. The ASCII data files include raw data and variable files that can be imported into any statistical software package for analysis. The file also includes a manual that describes the survey, anthropometric variables, and associated database codes.

For more information, contact a HSIAC representative or visit our Web site at
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